## 5.2 Tooth profile deviations

The degree of **accuracy for Spur and Helical gears** in JIS B1702 (old). Standard is defined by "sum of positive (+) deviation and negative (-) deviations from actual tooth profile within the Tooth profile evaluation range measured in perpendicular direction to actual Tooth profile and correct Involute which crosses the intersection point of Pitch circle." This explanation for Tooth profile deviation is for Axis profile only.

Definition of Profile evaluation range is range of Tooth profile curve when engaged with Mating gear. In short, not all range of Tooth depth engages with mating gear. Range in actual motion excludes Tooth tip and Dedendum.

However, Tooth profile deviation does not include parts with Profile modification. Refer to Fig. 3 for Tooth profile deviation. Tooth profile deviation has Pressure angle and unevenness deviations. Normally these two deviations appear at the same time.

Tooth profile deviation is always indicated as maximum value in Tooth profile evaluation range. Allowable deviation is listed in System of accuracy defined in JIS B1702 (old). In JIS B1752 (old), **method of measurement for Spur and Helical gears** have following 3 types stipulated.

- 1) Base disk method: In accordance with gear specifications, use Base disk with diameter equivalent to that its Base circle to measure. (Refer to Fig.4)
- 2) Base circle adjustment method: Use Base circle with mechanism that enlarges or reduces the measuring pointer in accordance with the diameter ratio between native Base circle and gear Base circle. (Fig. 5)
- Operation method: Use digital coordinates to measure the Tooth profile and compare with Theoretical involute profile to work out deviation.

There are other methods of Pitch disk, Master cam and Optics which are available but omitted here.



Fig. 3 Tooth profile deviation



Fig. 4 Measuring method for Base disk



Fig. 5 Mechanism for Base circle adjustment equipment